

STORMS AND WARNINGS—WEATHER AND CROPS.

FORECASTS AND WEATHER WARNINGS.

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Washington Forecast District.—Advices were issued on the 5th in connection with a disturbance that was passing northeastwardly along the Atlantic coast, and on the 6th northeast storm warnings were displayed on the New England coast at and east of New London, Conn. On the morning of the 15th storm warnings were displayed on Lakes Erie, Huron, Michigan, and eastern Superior, when a disturbance of considerable intensity was centered over the upper Lake Region, and following the display strong winds and squalls occurred, but these were not general.

The evening of the 18th the following advisory information was issued and sent to all ports on the southern coasts and to vessels at sea by naval radio:

Conditions are becoming threatening over the western Caribbean Sea and southeast Gulf of Mexico. There are strong indications of a disturbance in an early stage of development east of Yucatan, moving toward the Yucatan Channel. Caution is advised all vessels in east Gulf, northwest Caribbean Sea, Cuban, and south Atlantic waters. Further advices will be issued Sunday morning.

Sunday morning the following bulletin was distributed:

Tropical disturbance central this morning in latitude 18 and longitude 85 and moving slowly north-northwestward toward Yucatan Channel. Apparently of considerable intensity. Vessels in or bound for Yucatan Channel and northwest Caribbean Sea run risk of encountering dangerous conditions.

The subsequent warnings are noted on page 548, below.

Reports of this West Indian hurricane received from vessel masters in the Caribbean Sea and Gulf of Mexico will be found on pages 541-543, below, and a discussion of land observations of it and the damage done as its center passed through Louisiana will be found on pages 520-524, above.

The following excerpts were selected from newspaper editorials in widely separated parts of the United States:

AHEAD OF THE HURRICANE.

The storm now beating against our southern coast did not come as a surprise. Two days ago the Weather Bureau gave public warning of the hurricane's approach and was able, within fairly narrow limits, to tell where and when it would strike and what force would be back of the blow. Probably the shipping saved in this one tornado is greater in value than the cost of the Weather Bureau for years, and one does not like to fix a money value on the great saving of life. * * *—*Chicago Evening Journal, Sept. 22, 1920.*

VALUE OF WEATHER BUREAU ATTESTED.

The importance and value of the United States Weather Bureau service was unmistakably and impressively attested in connection with the terrific storm which on Tuesday night swept up from the Gulf of Mexico and struck the coast of the United States, particularly across Louisiana. Hours before the hurricane had reached the mainland the weather officials knew it was coming. Warnings were hurriedly sent out, not only to the shipping in the Gulf but to the cities, towns, and farms over the section that was threatened. As a result of the warnings, ships and especially the smaller craft out in the open scurried to shelter. Boats that were ready to sail remained in port. On land as well preparations were made to meet the storm. Shelters were constructed, insecure movables were fastened down, exposed goods were covered, contemplated traveling was postponed, trains were given added protection—in short, every possible precaution was taken to withstand the rage of the elements when it should break.

As a result of these preparations it is estimated that many lives were saved and much property loss prevented. The storm came in its fury and much damage was done; for it is not within the ability of man to

shield completely the open fields and their crops, his homes, and other possessions from torrential storm and hurricane. But when the violence had abated and a survey of the damage brought realization of what might have been suffered had the storm come unannounced there could not but be universal gratitude and appreciation of the ability of the weather service to forecast the future and send out its beneficial warning.—*Salt Lake Desert News, Sept. 23, 1920.*

A MILD HURRICANE.

The hurricane of this year did not prove as severe as many of its predecessors and the damage was comparatively small. This is partly due to the fact that residents along the coast have been fully educated to the danger of the hurricane and now adopt the sensible plan of getting out of the danger zone as much as possible and protecting their property as well as they can. There is small profit and little sense in the effort by a human being to fight a hurricane. Because of the precautions taken and through the additional fact that the storm was not as severe as has been known in other years, the country escaped with a minimum amount of damage and loss of life.

It must be said for the Weather Bureau in connection with the work of forecasting this storm, that it performed most admirable and valuable service. To predict when and where a West Indian hurricane will arrive at a given point and estimate with any degree of accuracy the condition in which it will arrive is no easy task. Indeed, there are times when the undertaking is simply impossible. There are no observation stations in the middle of the Gulf of Mexico and, lacking these, the Weather Bureau is sorely handicapped by the lack of necessary information.

On this storm, however, the bureau made a most excellent record. It reported its appearance in the western Caribbean Sea and estimated the time of its approach as closely as could possibly be done.—*San Antonio Daily Light, Sept. 23, 1920.*

On the 20th advisory information concerning a disturbance east of the Georgia coast was issued. This disturbance, of considerable intensity but apparently of very small diameter, passed inland near and west of the mouth of the Cape Fear River during the night of the 22d. Northeast storm warnings were displayed at 9:30 p. m. of this date at and between Cape Henry, Va., and Wilmington, N. C.

DETECTION OF THE STORM.

That the tropical storm that was detected by the United States Weather Bureau 500 or more miles out at sea spent its fury before coming inland is not the important point. Detection of the storm by the bureau and the ability of the bureau to give the threatened sections of the country information in advance of its coming is the paramount detail. The service rendered shipping at sea and life and property on shore through the timely warnings issued by the bureau may never be estimated. The Weather Bureau has made impossible occurrences of the past when ships went forth to be caught unaware in the teeth of a hurricane and when people ashore slept in fancied security from the coming of blast and flood that wreck property and destroy lives. In this instance, hundreds of ships were held safely in port, while people in seaport towns within the probable sweep of the storm were enabled to make preparations against its coming and summer population at coast resorts that might have been swept away were advantaged by the warning in having been given opportunity to get to places of safety. Cattle on islands that were threatened with submergence were taken to the mainland, and all the section through which the storm was expected to pass was placed in condition of defense against its coming. The Weather Bureau is a great institution and scarcely a week passes that it does not demonstrate its value to the country.—*Charlotte (N. C.) Observer, Sept. 23, 1920.*

On the morning of the 27th advices were issued of the presence of a disturbance of slight intensity over the east-central Gulf of Mexico, and later on that day when the indications of an increase in intensity of this disturbance were apparent additional cautionary advices were broadcast. On the 28th hurricane warnings were

ordered for the Gulf coast at and between Cedar Keys, Fla., and the mouth of the Mississippi River, and south-east storm warnings were displayed on the Florida coast at and between Tampa and Key West. The warnings on the Gulf coast were continued as displayed through the 29th, and all interests were fully warned. The center of this disturbance crossed the Coast Line near Cedar Keys, Fla., during the night of the 29th.

The hurricane warning of September 28 was received at 6.53 p. m., seventy-fifth meridian time; and the order to continue September 29 at 5.22 p. m. These were given the extraordinary dissemination as reported for the warning of September 21.

No damage occurred at Mobile. The value of the warning was in detaining vessels from proceeding to sea.—*Albert Ashenberger*, meteorologist, Mobile, Ala.

A detailed report of this storm and its effects in Florida is published on page 524 above.

The evening of the 29th storm warnings were displayed on the South Atlantic coast at and south of Cape Hatteras, and the morning of the 30th storm warnings were ordered displayed on the middle Atlantic and New England coasts and on Lakes Ontario, Erie, and Huron. This tropical disturbance increased in intensity while moving northeastward along the coast, and gales were general over the regions where warnings were displayed.

Mr. Royal Robbins, Nahant, Mass., made the following report on this storm in New England:

Storm of September 30 on the New England coast.—I have taken some pains to trace the course of the center of the severe tropical storm of September 30 and find it entered New England near New Haven, Conn., thence moving slightly east of north through the valley of the Connecticut River into Vermont, where it lost energy among the mountains. The winds were destructive in Connecticut and western Massachusetts, many thousand trees being blown down, with a number of buildings. In short, between midnight and 4 a. m. October 1 the storm reached nearly hurricane force over the interior of southern New England.

Frost warnings were issued on a number of days during the month.

Chicago Forecast District.—The weather continued mild until the closing days of the month, so that no general warnings were issued until the morning of the 28th.

However, warnings of frost for the cranberry marshes of Wisconsin were issued from time to time during the entire month, and they were for the most part fully verified.

Frost warnings were, moreover, issued on the 28th for the Northern and Central Plains States and Rocky Mountain region, and these were extended eastward to the limits of the forecast district on the 29th and 30th. These predictions were for the most part verified, but there were some failures chiefly in the vicinity of the Lakes because of persistent cloudiness or influence of the water surface.

A critical condition prevailed throughout the Corn Belt from the first of the month because of the lateness of the season, but the ensuing mild temperature proved highly favorable, resulting in maturing most of the corn crop before the close of the month. Special forecasts for continued mild temperature were daily included in the general statements printed on the weather map and on the Corn and Wheat Region Bulletin, as well as telegraphed to the corn and wheat region centers, up to the appearance of the cold high area in the Pacific Northwest on the morning of the 27th.

Special fire-weather forecasts, which had been sent to the District Forester at Missoula for use in connection with the National Forests of Montana, were discontinued for the season on September 13.

Special fire-weather forecasts, beginning September 8, were telegraphed daily to the State forests in Minnesota.

Special long-range weekly forecast was sent to Topeka, Kans., on the 12th for use in connection with the State fair, as follows:

Fair to-night and Monday; rising temperature and conditions favorable for mostly fair weather during the week with rather high temperature.

This forecast proved to be quite satisfactory, as shown by the following extract from the Topeka State Journal:

The biggest free fair in history owes a lot to the Weather Bureau this year for its unqualified success. Of course, the Weather Bureau didn't make the weather to order, but the unprecedented crowds came because they had confidence in the prediction of good weather and good roads.—*H. J. Cox*.

New Orleans Forecast District.—A tropical disturbance moved across the Gulf of Mexico during the 20th and 21st, traveling at the rate of about 22 miles per hour. This disturbance moved inland over Louisiana with its center a little east of and nearly over Morgan City, La. The Central Office issued warnings in connection with this disturbance as follows:

September 20: Northeast storm warnings, 10 p. m., New Orleans, La., to Port Lavacoe, Tex., and northwest storm warnings, Corpus Christi to Brownsville, Tex.

September 21: Hurricane warnings were ordered, 10 a. m., for southwest Louisiana and from Port Arthur to Corpus Christi, Tex.

September 21: Change to southeast storm warnings, east Louisiana coast, and continue hurricane warnings southwest Louisiana and Port Arthur to Corpus Christi, Tex., and northwest storm warnings, Brownsville, Tex., 10 p. m. (message received 4:53 p. m.).

September 21: Change to hurricane warnings, New Orleans to Pensacola, Fla., 9 p. m.

The special features connected with the life history of this storm and the damage resulting therefrom will be found in a special paper dealing with this subject (pp. 520-524, above).

Hurricane warnings were ordered for Burrwood, La., 6 p. m., September 28; continued, 6 p. m., September 29, and changed to northwest storm warnings, 11 p. m., September 29. The east Louisiana coast was in the left segment of a disturbance moving northeastward through the Gulf of Mexico, and consequently neither storm winds nor high tides occurred.

Small craft warnings for northerly winds were displayed on the Texas coast 11 a. m. September 29.

Frost warnings were issued September 29 for the Texas Panhandle and Oklahoma, and heavy frosts occurred on the 30th, the first of the season. The high-pressure area did not move eastward as rapidly as expected and light frost occurred October 1 at scattered stations in Arkansas and the interior of Louisiana.—*I. M. CLINE*.

Denver Forecast District.—Much unsettled weather prevailed in this district during September, but the rainfall was in general light. At Yuma, Ariz., however, 1.48 inches fell in 12 hours on the 15th, which was the heaviest 24-hour reported at regular Weather Bureau stations. Temperatures were somewhat below normal. The first light frost of the month at the moderate elevations occurred at Durango, Colo., on the 7th; this was the first of the season, barring that on the 28th of August, at the same place. Heavy frost occurred at Durango on 10th, 11th, and 22d. Killing frost was reported at Modena, Utah, on the 23d. Frosts, from light to killing, occurred quite generally in Utah, Colorado, and New Mexico on the 24th. Frost warnings were issued for high districts on the 1st, 10th, 11th, 15th, and for all elevations on the 21st, 23d, 25th, 26th, 27th, 28th, 29th, and 30th. These were verified quite generally. A noteworthy fall in temperature occurred at Modena, Utah, on the morning of the 25th when the lowest was 24°, the lowest for September on record.—*A. H. Thiessen*.